(2) $\lim_{x\to 3^+} \frac{x^2-x}{x^2-9} = \boxed{\infty}$

approaching $3^2-3=6$

approaching 0, positive

(4) $\lim_{x\to 1^+} \ln\left(\frac{x^2-x}{x-1}\right) = \lim_{x\to 1^+} \ln\left(\frac{x(x-1)}{x-1}\right)$

$= \lim_{x\to 1^+} \ln(x) = \ln(1) = \boxed{0}$

(6) $\lim_{x\to \pi^+} \frac{\cos(x)}{1+\cos(x)} = \boxed{-\infty}$

approaches -1

approaches 0, positive

(8) $\lim_{x\to 0^+} \frac{\sin(x)}{x^2} = \lim_{x\to 0} \frac{\sin(x)}{x}\,\frac{1}{x} = \boxed{\infty}$

$\frac{\sin(x)}{x}$ approaches 1; $\frac{1}{x}$ approaches ∞

(18) Find the vertical asymptotes of $f(x) = \frac{15-12x-3x^2}{50-2x^2}$

$f(x) = \frac{3(5-4x-x^2)}{2(25-x^2)} = \frac{3(5+x)(1-x)}{2(5-x)(5+x)} = \frac{3(1-x)}{2(5-x)}$ For $x \neq -5$

Denominator is 0 for $x=5$ and $x=-5$, so these are the candidates for the vertical asymptotes.

Check $x=5$ $\lim_{x\to 5^+} f(x) = \lim_{x\to 5^+} \frac{3(1-x)}{2(5-x)} = \boxed{\infty}$

Check $x=-5$ $\lim_{x\to -5} f(x) = \lim_{x\to -5} \frac{3(1-x)}{2(5-(-5))} = \frac{18}{20} = \boxed{\frac{9}{10}} \neq \infty$

ANS The line $x=5$ is the only vertical asymptote